

WHAT IS CLAIMED IS:

1. A method for identifying a signal source in a predetermined space, comprising:
 - inventorying a set of identified signatures corresponding to a plurality of signal sources;
 - recording a signal simultaneously at different locations of the predetermined space;
 - storing parameters related to the conditions under which the recordings are made;
 - determining a spectrum of the signal;
 - detecting a line emerging from background noise of the spectrum by using a predetermined emergence threshold;
 - comparing the line with some or all of the signatures included in the set of identified signatures;
 - selecting at least one signature corresponding to the line to create at least one signature/line pair; and
 - identifying a source of the signal based on the selecting step.
2. The method of Claim 1, wherein when the selecting step results in only one signature/line pair, the identifying step includes a consolidating step that includes:
 - modifying a measurement parameter,
 - comparing a recording corresponding to the modified parameter with the recording of the detected signal,
 - retaining the signature for the line if the signal is modified as predicted in the signature retained by modifying the parameter, and
 - quantifying the source corresponding to the line if the signal is not modified as predicted in the signature retained by modifying the parameter.
3. The method of Claim 2, wherein the measurement parameter to be modified is chosen automatically as a function of the characteristics of the selected signature or signatures.

4. The method of Claim 2, wherein the first parameter modified is the location at which the measurement is taken.

5. The method of Claim 1, wherein when the selecting step results in two or more signature/line pairs, the identifying step includes an ambiguity resolving step that includes:

- modifying a measuring parameter,
- comparing a recording corresponding to the modified parameter with the recording of the detected signal;
- analyzing the modification of the signal,
- searching for signature/line pairs verifying a modification conforming to the observed modification,
- retaining a signature for the line if only one signature/line pair verifies the observed modification,
- restarting the ambiguity resolving step by modifying another parameter if a plurality of signature/line pairs verifies the modification, and
- quantifying the source corresponding to the line if no signature/line pair verifies the modification.

6. The method of Claim 5, wherein the measurement parameter to be modified is chosen automatically as a function of the characteristics of the selected signature or signatures.

7. The method of Claim 6, wherein the first parameter modified is the location at which the measurement is taken.

8. The method of Claim 1, wherein when the selecting step results in no signature/line pair, the identifying step includes a source quantifying step that includes:

- comparing the line with a greater number of signatures if the comparing step applied to only some of the signatures included in the set of identified signatures,

carrying out a consolidation step or an ambiguity resolving step if a signature is then found and depending on the number of signatures found, and

carrying out additional measurements with different parameters if a signature is not found.

9. The method of Claim 1, wherein the inventoried signatures include information related to:

the range of frequencies of the signal emitted by each corresponding source,

the conditions under which the signal emitted by each corresponding source is present,

and

the effects of modifying one or more parameters on the signal emitted by each source.

10. The method of Claim 1, wherein the recorded signal is processed by a fast Fourier transform to obtain a single spectrum by weighting and averaging.

11. The method of Claim 1, wherein a non-weighted spectrum is generated and a picket fence effect correction is applied prior to weighting.

12. The method of Claim 1, wherein a power density spectrum correction is applied to the emergent lines of the spectrum.

13. The method of Claim 1, wherein the predetermined space is the interior of a transportation vehicle.

14. A method for identifying a signal source in a vehicle, comprising:

providing a set of identified signatures, wherein each signature is associated with a signal source;

providing a plurality of sensors at different locations of the vehicle;

creating at least one original recording of a signal detected by at least one of the sensors;

storing parameters related to the conditions under which the at least one recording is created, wherein one of the parameters is related to speed of the vehicle;

determining a spectrum of the signal;

detecting at least one line emerging from background noise of the spectrum by using a predetermined emergence threshold;

comparing the at least one line with at least one of the signatures in the set of identified signatures;

corresponding at least one of the signatures to the at least one line; and

identifying a source of the signal based on the corresponding step.

15. The method of Claim 14, wherein the identifying step includes modifying a stored parameter and comparing a subsequent recording of the signal to the at least one original recording of the signal.

16. The method of Claim 15, wherein the modified parameter is a sensor location.

17. The method of Claim 14, wherein,

the vehicle is an aircraft, and

parameters stored in the storing step are flight parameters of the aircraft including the altitude of the vehicle, the flight phase of the vehicle, and engine revolutions.

18. The method of Claim 17, wherein the creating step includes recording the signal during a stable flight phase over a time period between 5 seconds and 30 seconds.